NMME Year 2: verification of real-time monthly-mean forecasts

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Climate Diagnostics & Prediction Workshop

October 22, 2013 College Park, MD

International Conference on Subseasonal to Seasonal Prediction

WMO WWRP/THORPEX-WCRP joint S2S research project

The conference will bring together the research community, the operational centers, and the applications community interested on subseasonal to seasonal timescale

Dates:
10-13 February 2014

Location:
NOAA Center for Weather and Climate Prediction
5830 University Research Court
College Park, MD, USA

S2S Goals:
(1) Improve forecast skill and understanding on the timescale between two weeks and a season
(2) Promote its uptake by operational centers and
(3) Exploitation by the applications community

International Conference on Subseasonal to Seasonal Prediction

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http://www.emc.ncep.noaa.gov/gmb/ens/s2s/

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What's new in Year 2?

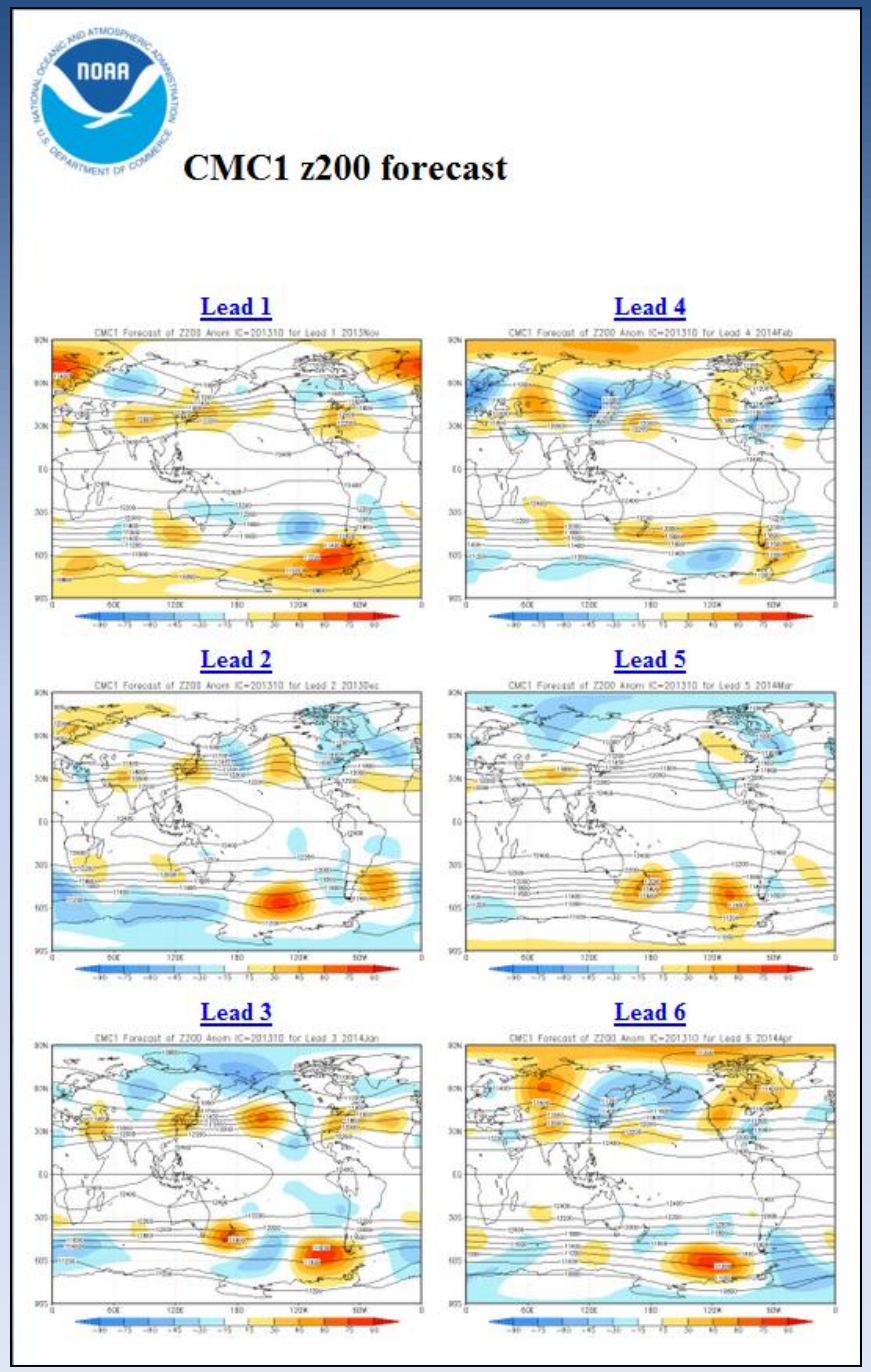
- New operational configuration with six models
- Additional variables
- Experimental probability forecasts
- Real-time verification

Phase I forecast models

Model	Hindcast Period	Ensemble Size	Lead Times	Forecast
NCEP-CFSv1	1981-2009	15	0-8 Months	Aug 2011 – Oct 2012
NCEP-CFSv2	1982-2010	24(28)	0-9 Months	Aug 2011 – present
GFDL-CM2.2	1982-2010	10	0-11 Months	Aug 2011 – present
IRI-ECHAM4-a	1982-2010	12	0-7 Months	Aug 2011 – Jul 2012
IRI-ECHAM4-f	1982-2010	12	0-7 Months	Aug 2011 – Jul 2012
CMC1-CanCM3	1981-2010	10	0-11 Months	Aug 2012 – present
CMC2-CanCM4	1981-2010	10	0-11 Months	Aug 2012 – present
NCAR-CCSM3.0	1982-2010	6	0-11 Months	Aug 2011 – present
NASA-GEOS5	1981-2010	10	0-9 Months	Aug 2011 – present

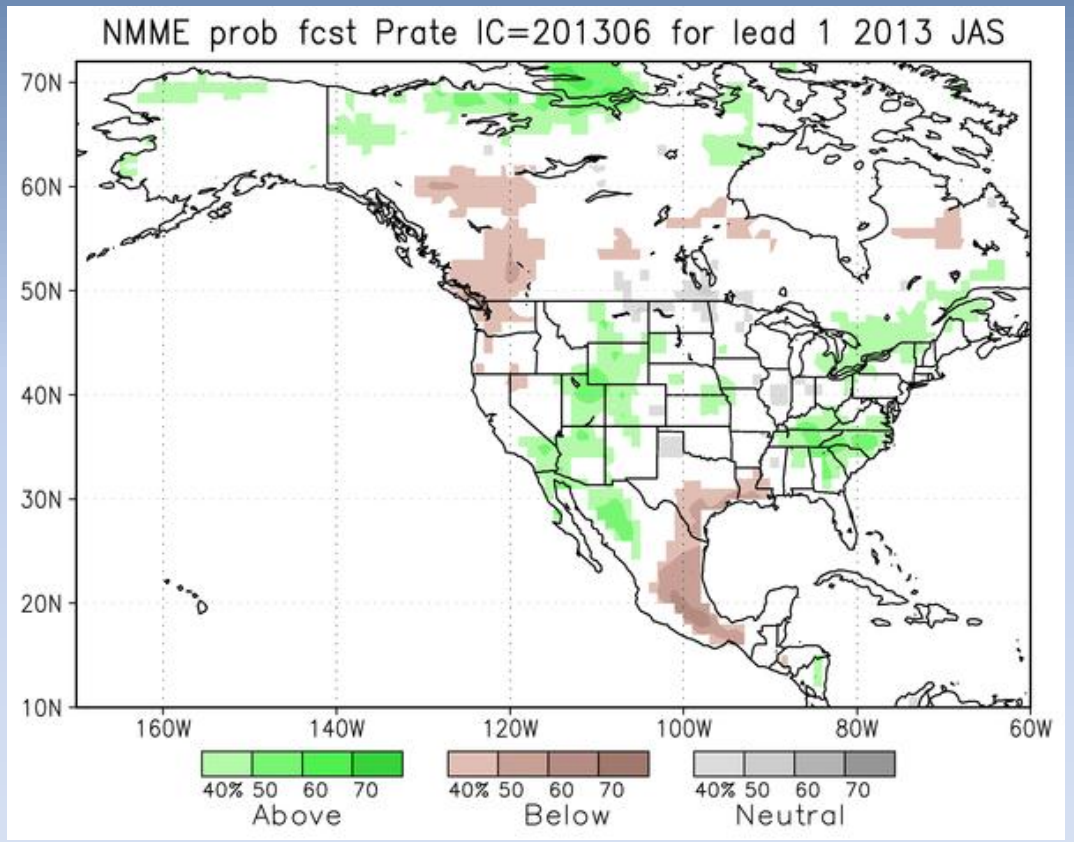
New in Year 2: Additional variables

- Live since April, 2013
- 200 mb heights
- Tmax, Tmin
- Soil moisture and runoff forecasts for North America



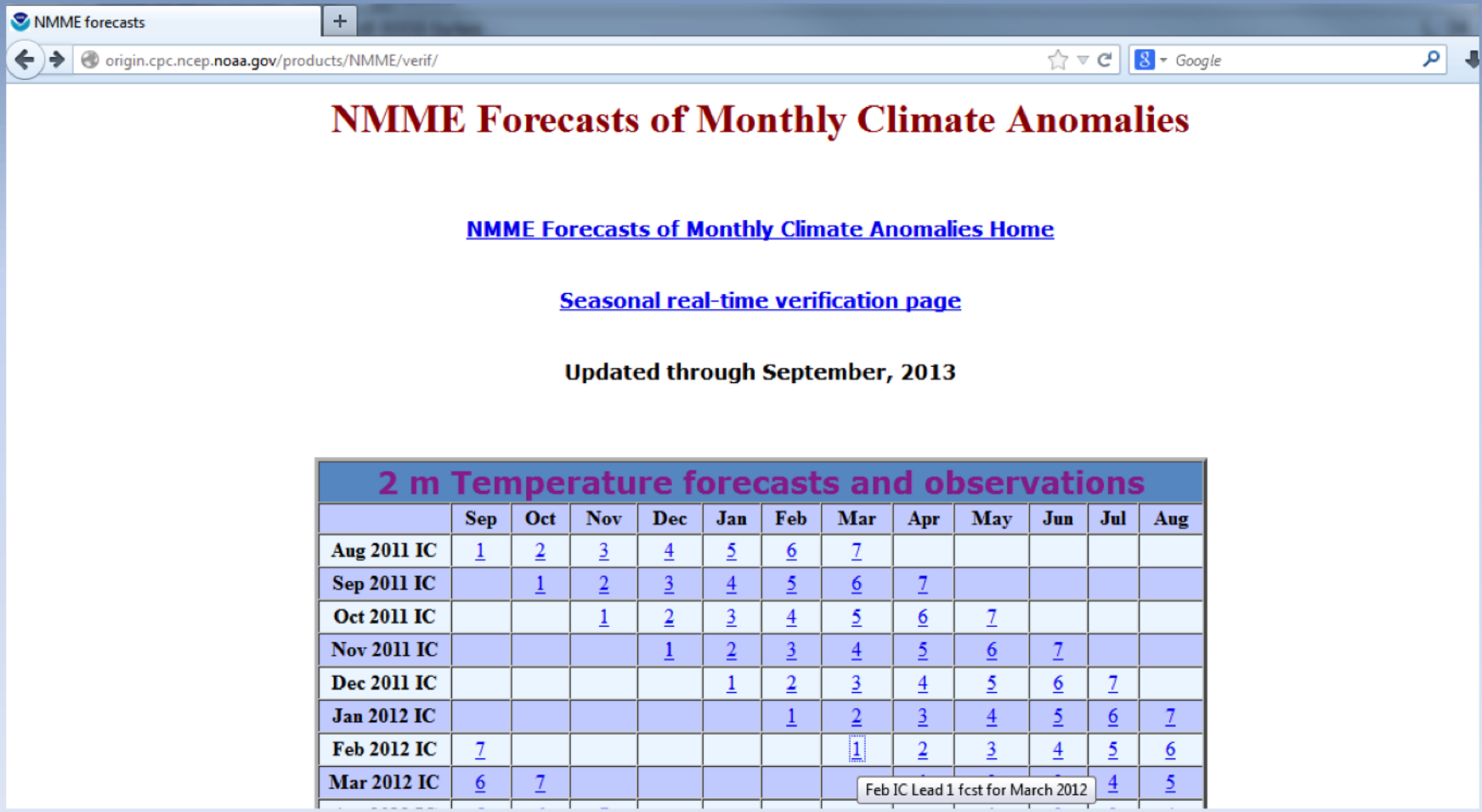
New in Year 2: Experimental probability forecasts

- Live since November, 2013
- A/B/N; tercile limits determined using the hindcasts
- Percent of NMME members in each category
- Usually 79 members total in NMME forecast Year 2



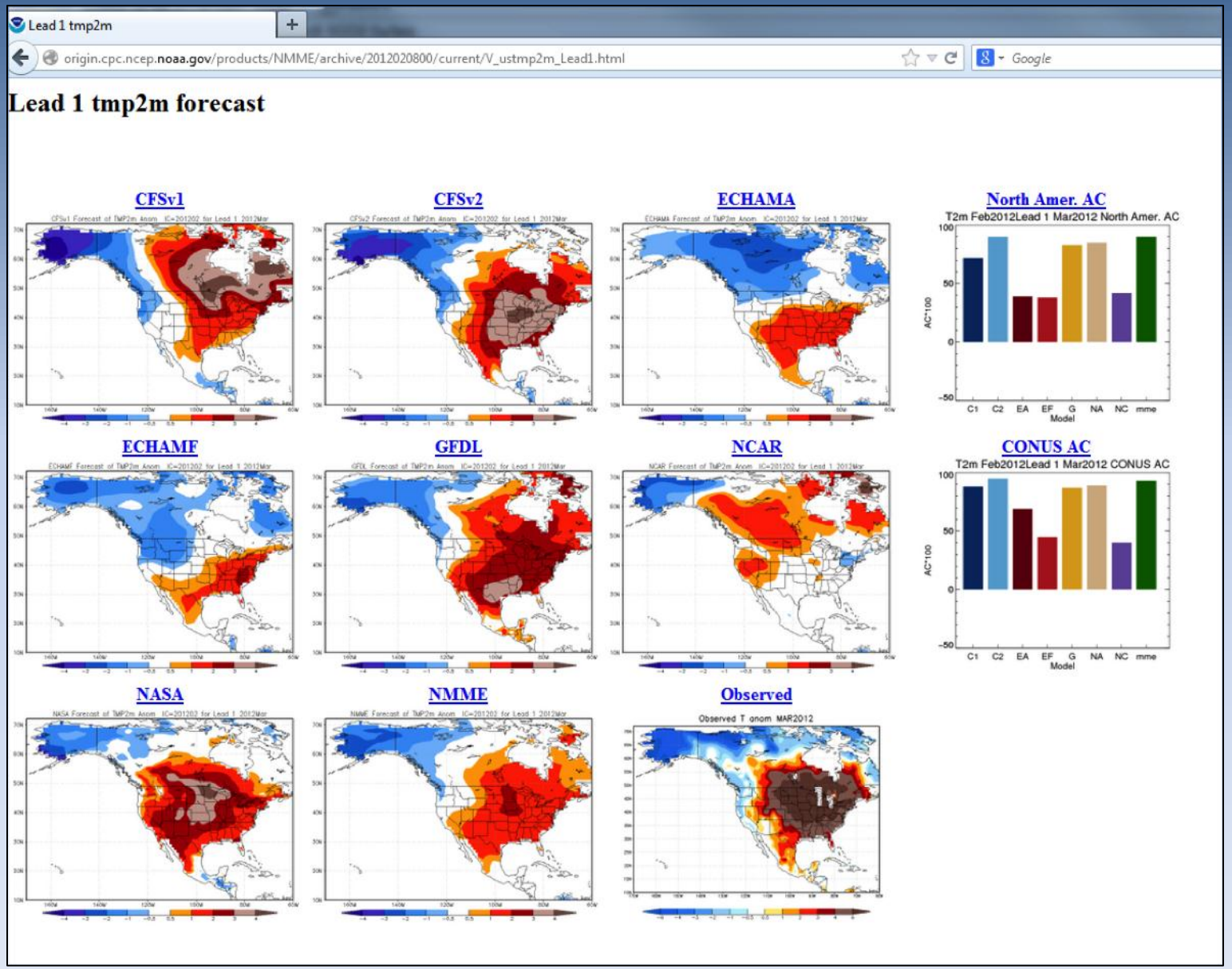
New in Year 2: Real-time verification

www.cpc.ncep.noaa.gov/products/NMME/verif/

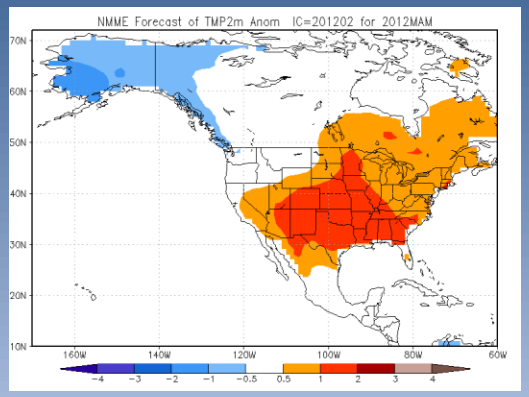


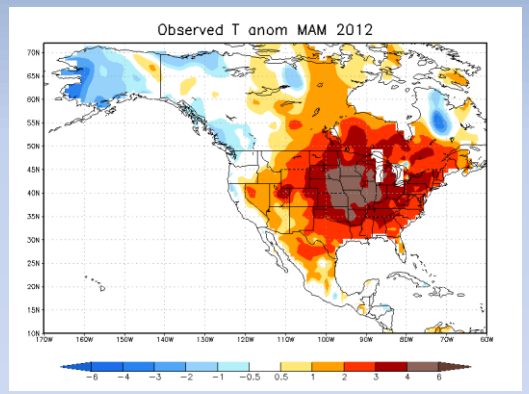
2 m Temperature forecasts and observations												
	SON	OND	NDJ	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO
Aug 2011 IC	1	2	3	4	5							
Sep 2011 IC		1	2	3	4	5						
Oct 2011 IC			1	2	3	4	5					
Nov 2011 IC				1	2	3	4	5				
Dec 2011 IC					1	2	3	4	5			
Jan 2012 IC						1	2	3	4	5		
Feb 2012 IC							1	2	3	4	5	
Mar 2012 IC								1	2	3	4	5
Apr 2012 IC	5								1	2	3	4
May 2012 IC	4	5								1	2	3
Jun 2012 IC	3	4	5								1	2
Jul 2012 IC	2	3	4	5								1
Aug 2012 IC	1	2	3	4	5							
Sep 2012 IC		1	2	3	4	5						
Oct 2012 IC			1	2	3	4	5					
Nov 2012 IC				1	2	3	4	5				
Dec 2012 IC					1	2	3	4	5			
Jan 2013 IC						1	2	3	4	5		
Feb 2013 IC								2	3	4	5	
Mar 2013 IC								1	2	3	4	5
Apr 2013 IC	5								1	2	3	4
May 2013 IC	4	5								1	2	3
Jun 2013 IC	3	4	5								1	2
Jul 2013 IC	2	3	4	5								1
Aug 2013 IC	1	2	3	4	5							

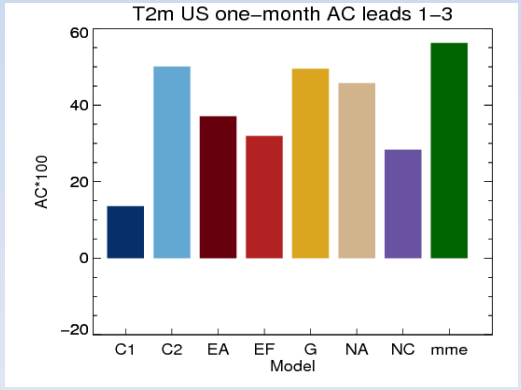
New in Year 2: Real-time verification



Real-time verification







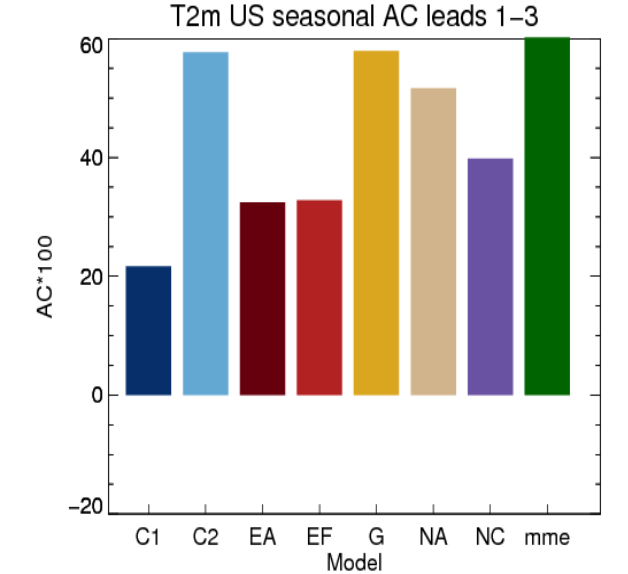
- Year 1: SON 2011 – ASO 2012
- Year 2: SON 2012 – JJA 2013
- ACs for leads 1-3
  - "lead 1": e.g., from January ICs, lead-1 is Feb-Mar-Apr, lead-2 is MAM, etc.
- Area-averaged AC over CONUS, North America, South-East Asia, Europe (sorry, Africa and Southern Hemisphere.)

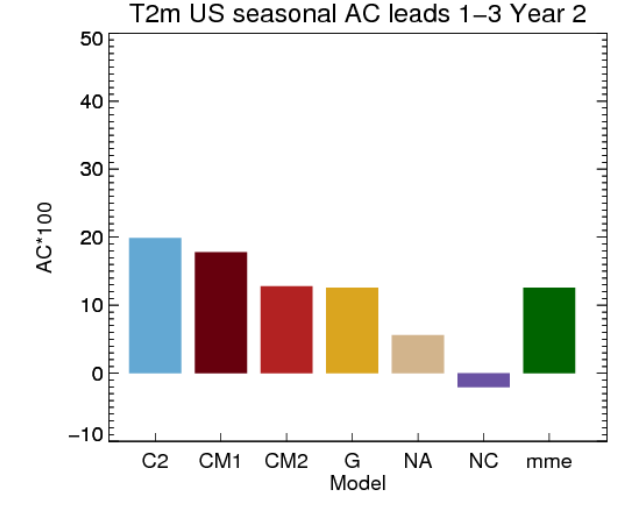
RT verification: CONUS

Year 1

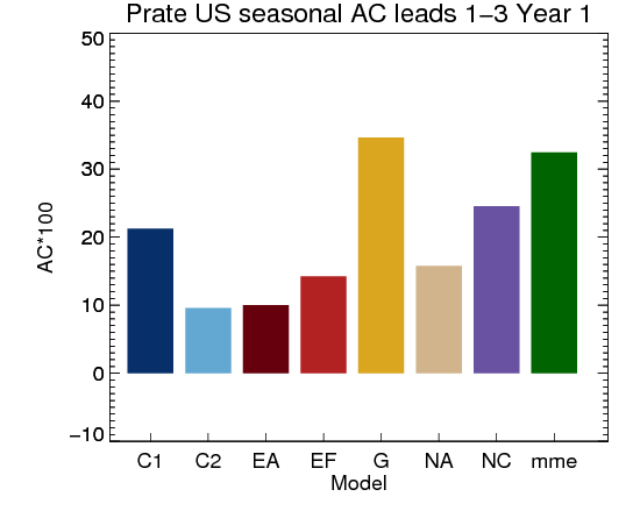
Year 2

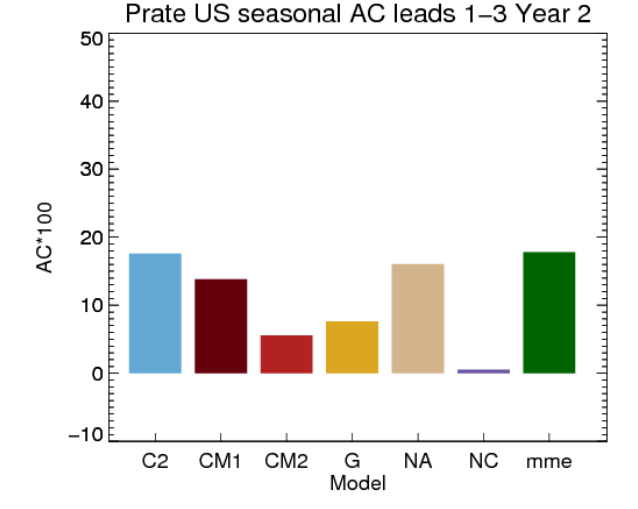
T2m





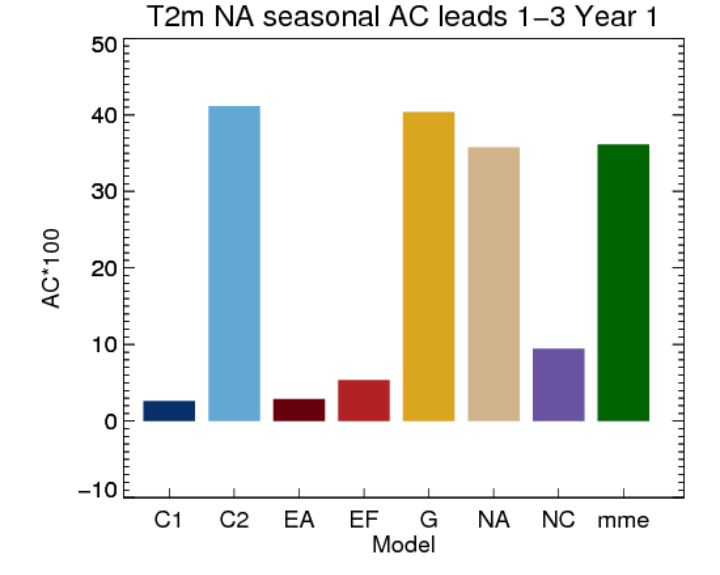
Prate

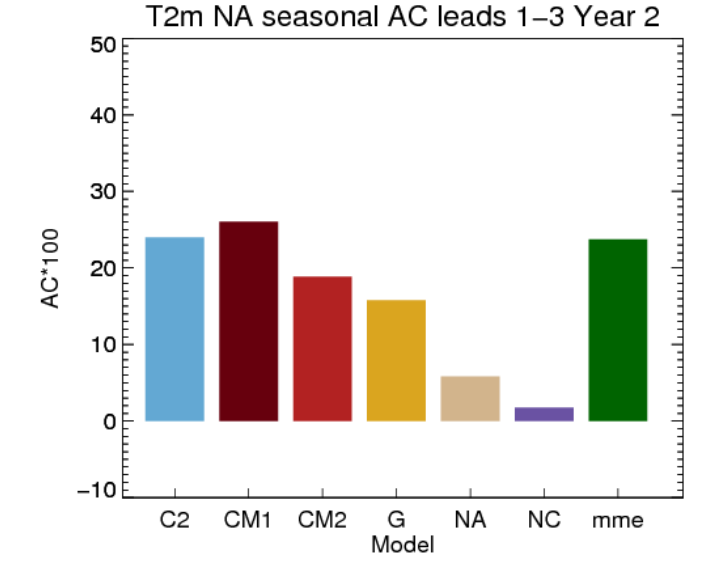




RT verification: North America

T2m





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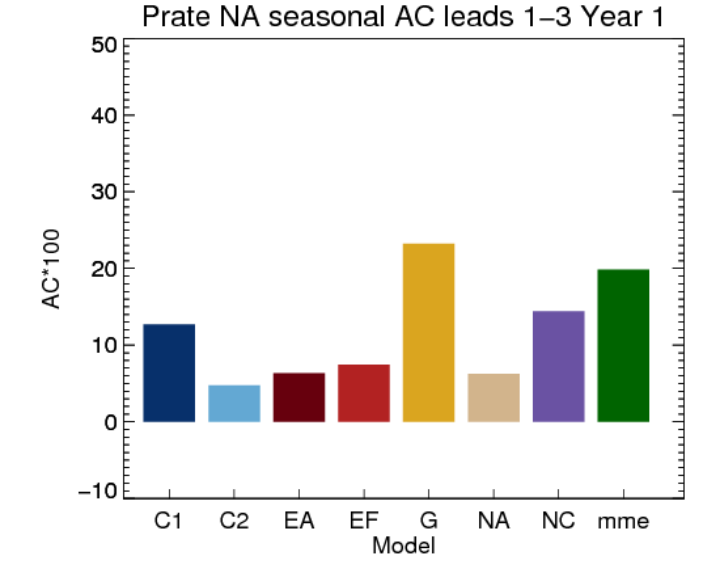
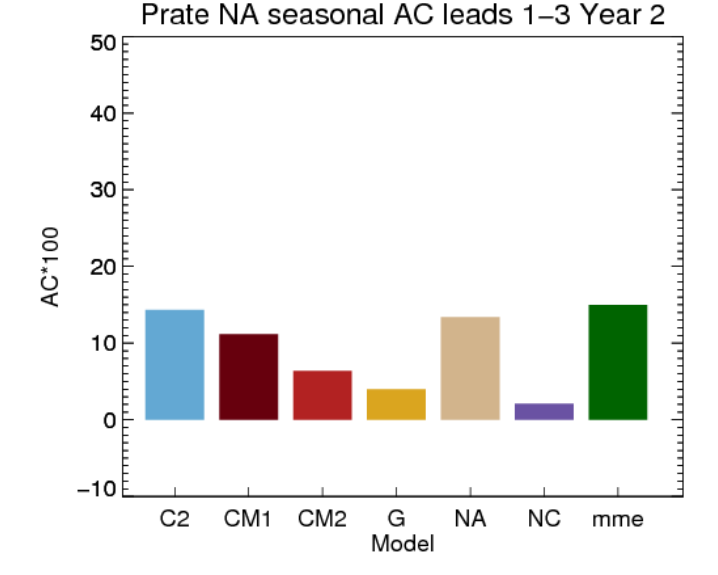
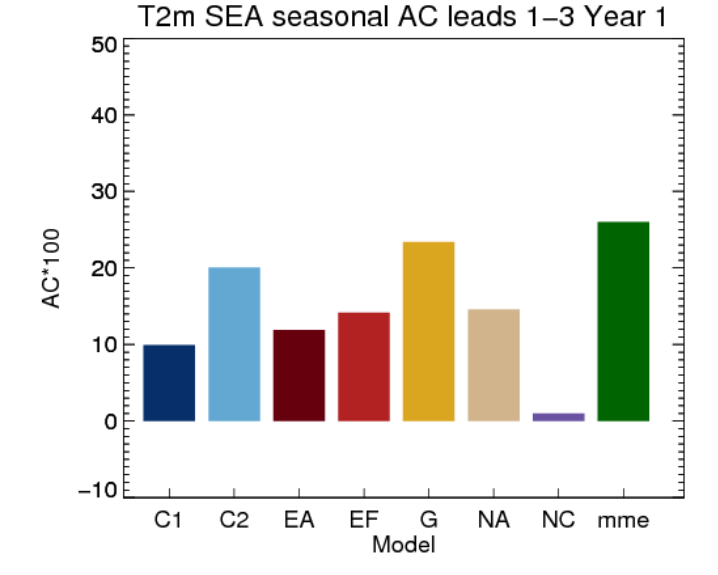
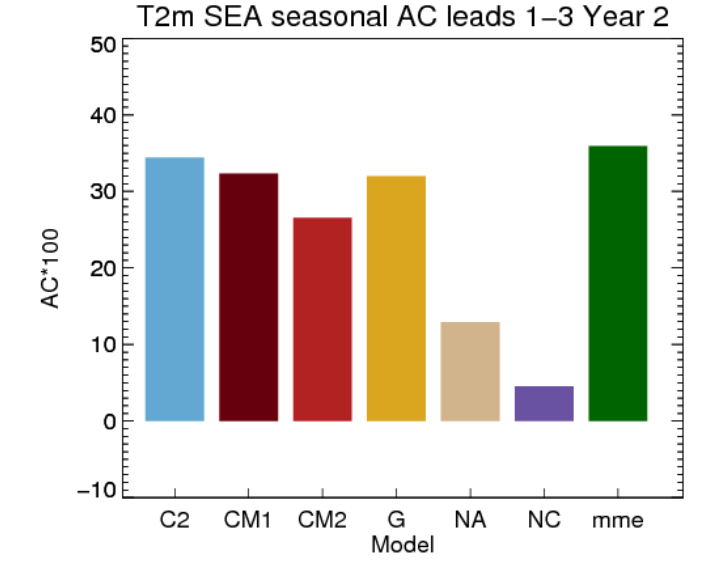




RT verification: South-East Asia

T2m





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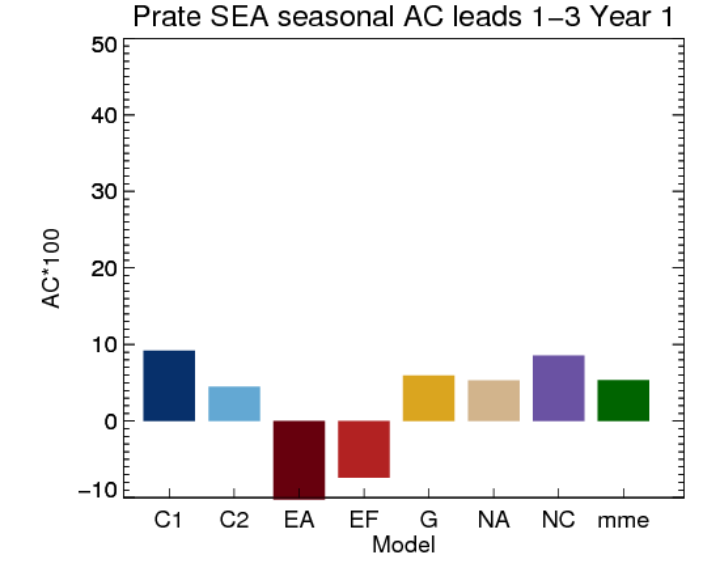
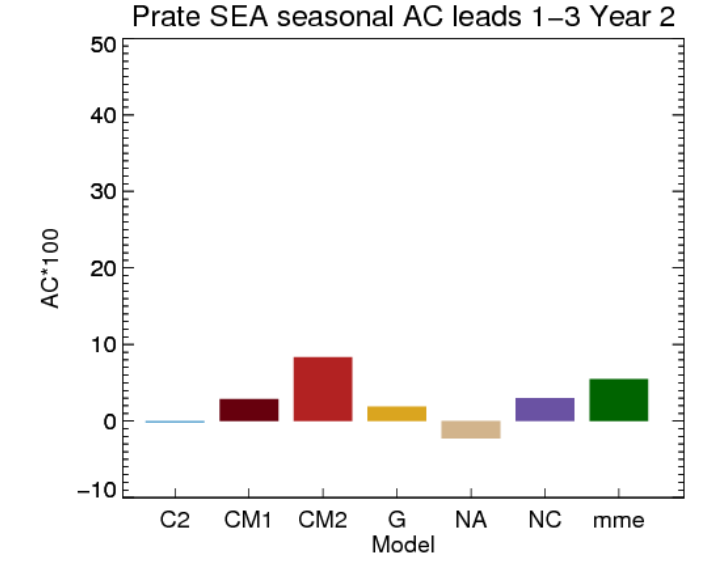
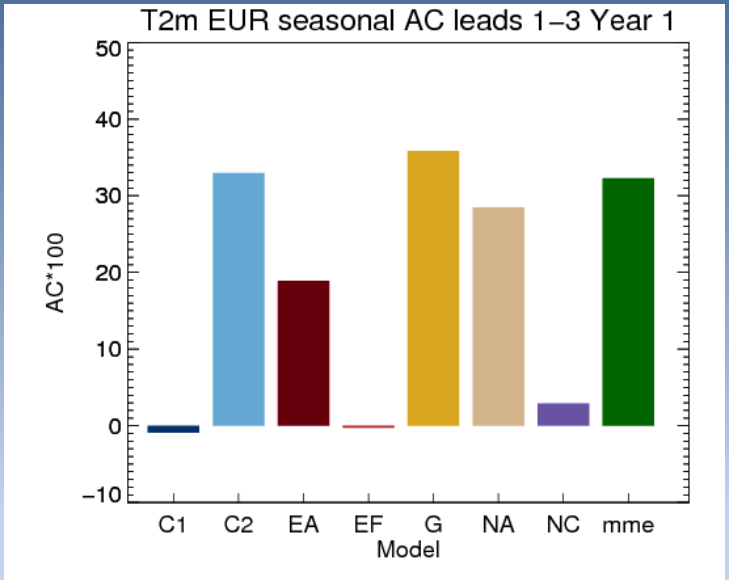
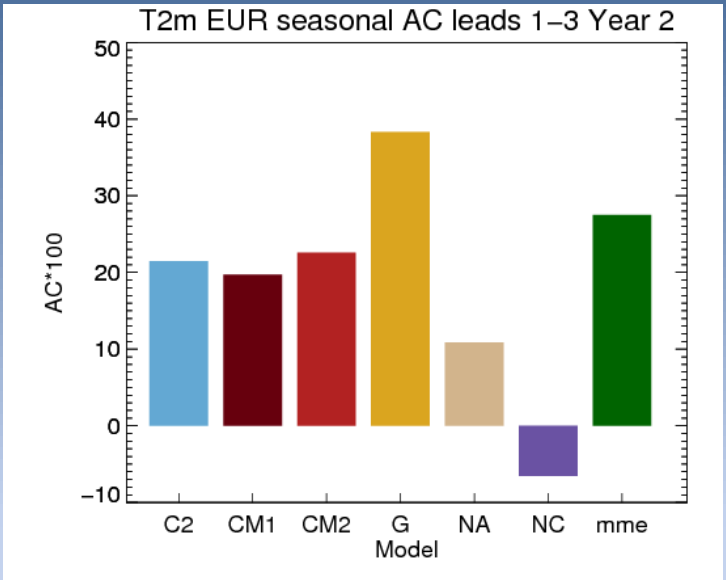




RT verification: Europe

T2m





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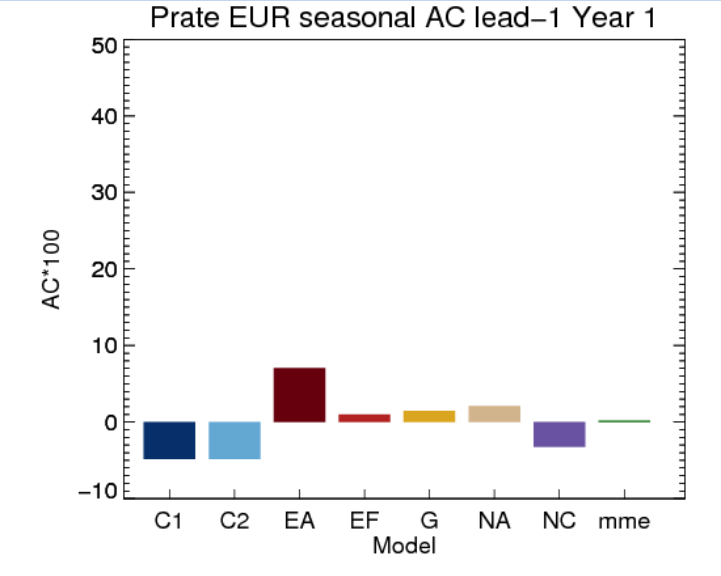

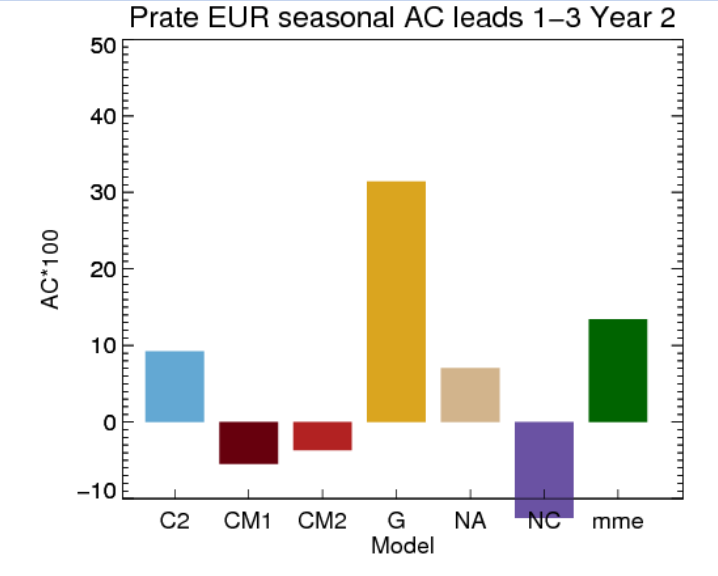

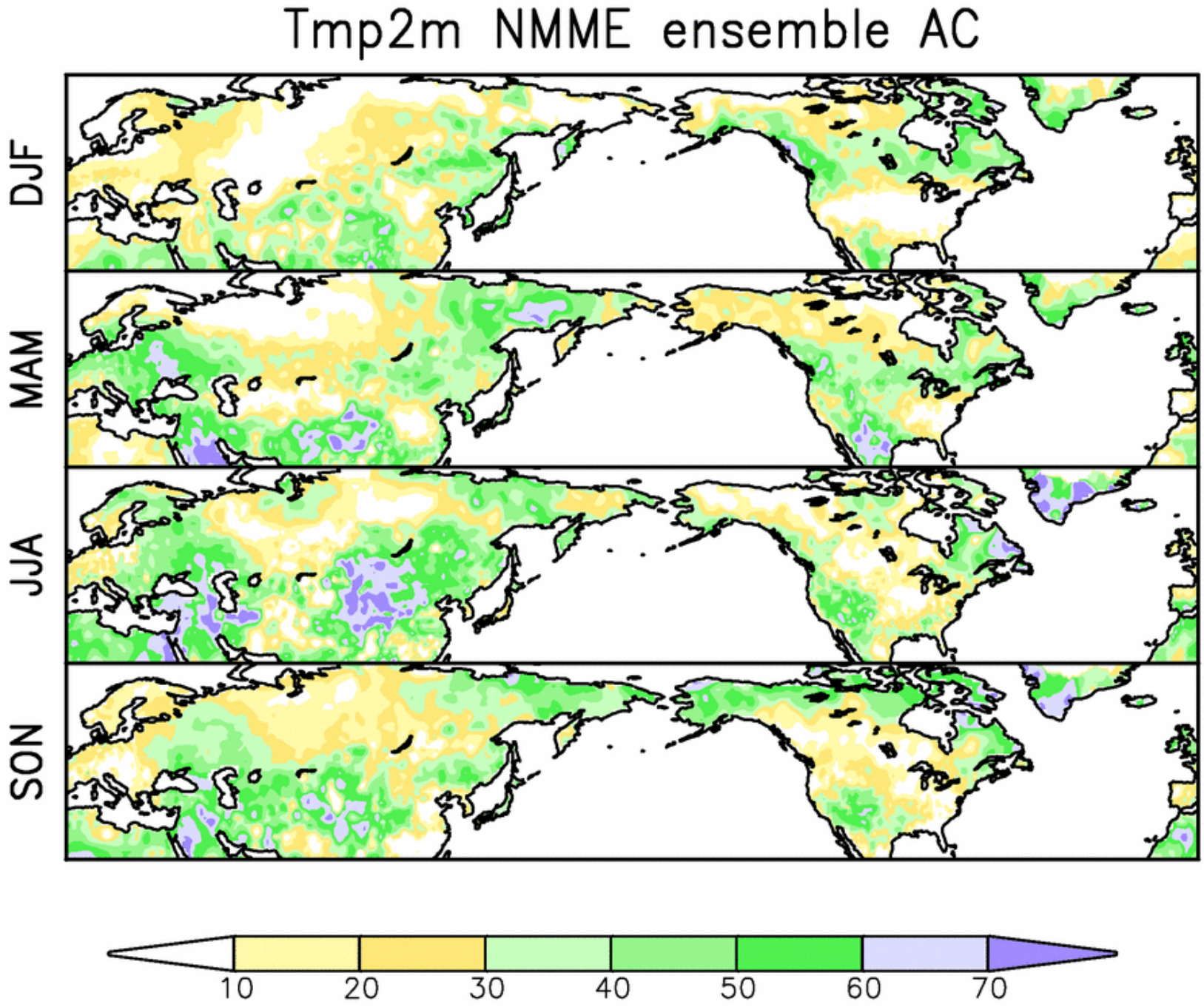
Tmp2m NMME ensemble AC
DJF
MAM
JJA
SON
10
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40
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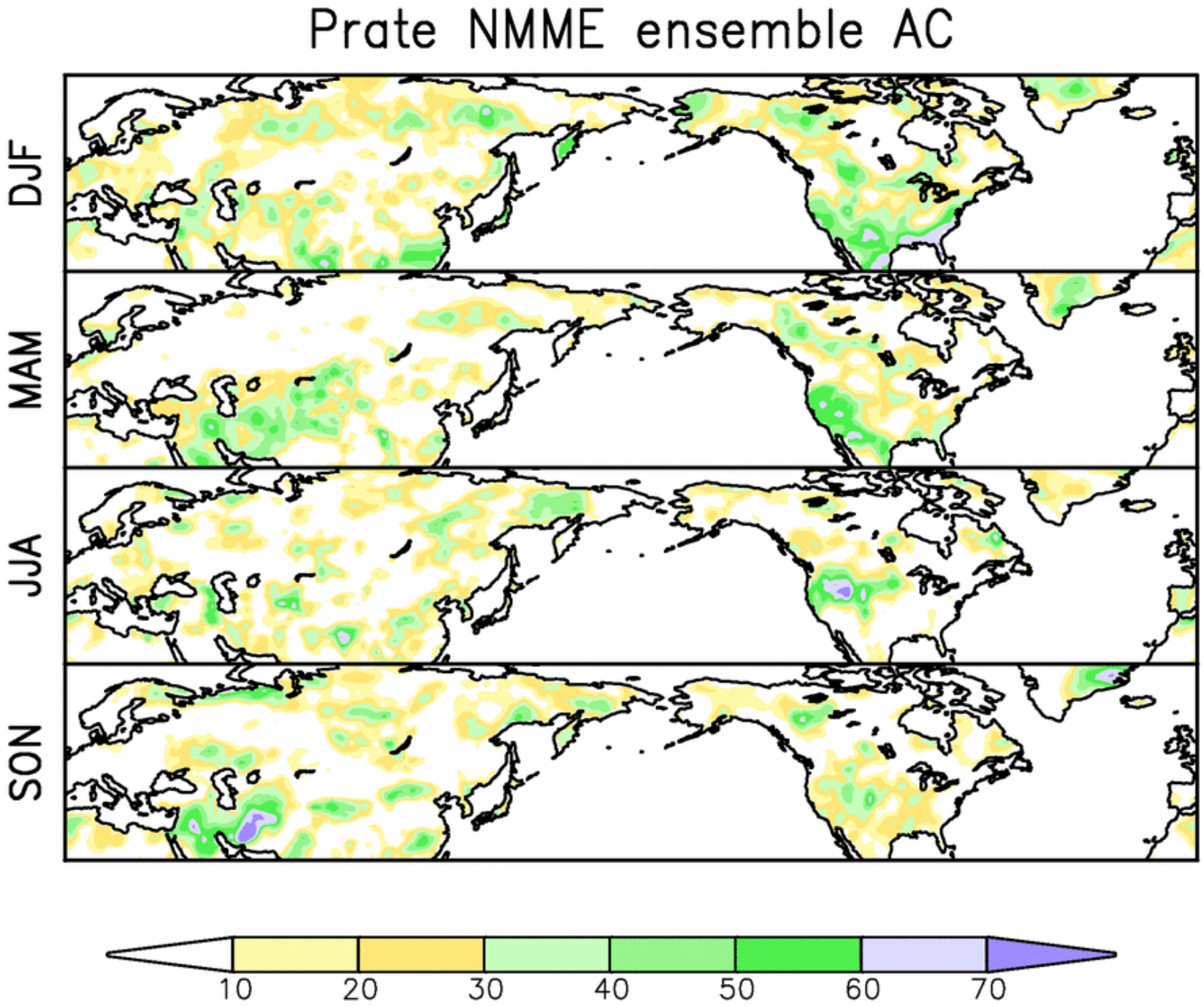
Prate NMME ensemble AC
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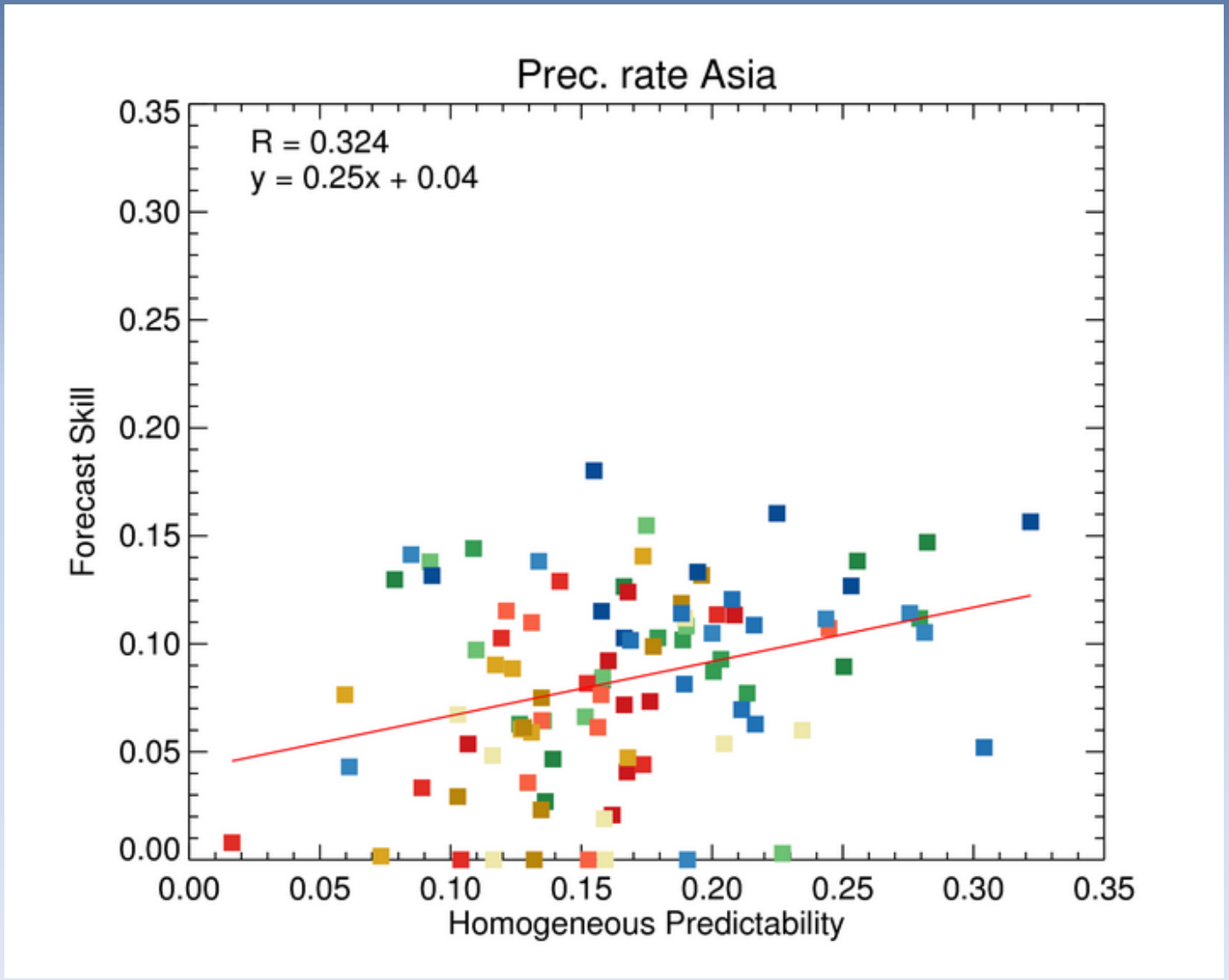
predictability of prate in SE Asia from NMME hindcast data



Year 2 recap

- New variables and analyses added to web
- Real-time verification finds that the MME forecast is not always the highest-scoring, but is among the highest

Year 3 preview

- New webpage with GIS capability will allow spatial sub-subsetting, view selection, generally move us into 21st century
- Verification of probability forecasts
- Verification of SST
- Phase 2